

AMENDMENT TO THE CLAIMS

1-30. (Cancelled)

31. (Previously presented) A method for forming a shallow junction comprising the steps of:

forming an amorphous layer at a shallow region in a silicon substrate by irradiating a plasma containing He; and

introducing an impurity by applying a plasma to the shallow region of the silicon substrate; and

applying light having an intensity peak at a wavelength of 375nm or longer on the silicon substrate so that said shallow region is excited selectively and the shallow junction is formed electrically activated with the impurity.

32. (Canceled)

33. (Currently amended) The method for forming a shallow junction according to claim 31, wherein the plasma is comprised ~~mainly~~ of He.

34. (Previously presented) The method for forming a shallow junction according to claim 31, wherein the plasma consists of He.

35. (Canceled)

36. (Previously presented) The method for forming a shallow junction according to claim 31, wherein, assuming that wavelength is $\lambda(\text{nm})$ and light absorption ratio is $A(\%)$, the light absorption rate of a layer which is formed by introducing the impurity into the substrate satisfies at least one of following conditions:

- at the wavelength ranging from 375 nm (inclusive) to 500 nm, $A > 7E32\lambda^{-12.316}$;
- at the wavelength ranging from 500 nm (inclusive) to 600 nm, $A > 2E19\lambda^{-7.278}$;
- at the wavelength ranging from 600 nm (inclusive) to 700 nm, $A > 4E14\lambda^{-5.5849}$; and
- at the wavelength ranging from 700 nm (inclusive) to 800 nm, $A > 2E12\lambda^{-4.773}$.

37. (Previously presented) The method for forming a shallow junction according to claim 31, wherein, assuming that wavelength is $\lambda(\text{nm})$ and absorption coefficient is $\alpha(\text{cm}^{-1})$, the light absorption coefficient of a layer which is formed by introducing the impurity into the substrate satisfies at least one of following conditions:

- at the wavelength ranging from 375 nm (inclusive) to 500 nm, $\alpha > 1E38\lambda^{-12.505}$;
- at the wavelength ranging from 500 nm (inclusive) to 600 nm, $\alpha > 1E24\lambda^{-7.2684}$;
- at the wavelength ranging from 600 nm (inclusive) to 700 nm, $\alpha > 2E19\lambda^{-5.5873}$; and
- at the wavelength ranging from 700 nm (inclusive) to 800 nm, $\alpha > 1E17\lambda^{-4.7782}$.

38-39. (Canceled)

40. (Previously presented) The method for forming a shallow junction according to claim 31, wherein the step of applying light is a step of irradiating light having an intensity peak at wavelength longer than 375 nm (inclusive) and shorter than 800 nm (inclusive).

41. (Previously presented) The method for forming a shallow junction according to claim 40, wherein the light having the intensity peak at the wavelength longer than 375 nm (inclusive) and shorter than 800 nm (inclusive) is a xenon flash lamp light.

42. (Previously presented) The method for forming a shallow junction according to claim 31, wherein the silicon substrate is a substrate having a (100) plane or the silicon substrate comprises a plane inclined from the (100) plane by several degrees.

43. (Previously presented) The method for forming a shallow junction according to claim 31, wherein, assuming that wavelength is λ (nm) and absorption ratio is A (%), the light absorption ratio of a layer into which the impurity is introduced for light having a wavelengths longer than 375 nm (inclusive) and shorter than 800 nm (inclusive) satisfies $A > 1E19\lambda^{-6.833}$.

44. (Previously presented) The method for forming a shallow junction according to claim 31, wherein, assuming that wavelength is λ (nm) and absorption coefficient is α (cm^{-1}), the light absorption coefficient of a layer into which the impurity is introduced to light having wavelengths longer than 375 nm (inclusive) and shorter than 800 nm (inclusive) satisfies $\alpha > 1E19\lambda^{-7.1693}$.

45. (Previously presented) The method for forming a shallow junction according to claim 31, wherein the step of introducing the impurity is a step of introducing the impurity by plasma doping.

46. (Previously presented) The method for forming a shallow junction according to claim 31, wherein the substrate is a SOI substrate with a Silicon thin film formed on a surface thereof.

47. (Previously presented) The method for forming a shallow junction according to claim 31, wherein the substrate is a strained Si substrate with a Si film formed on a surface thereof.

48. (Previously presented) The method for forming a shallow junction according to claim 31, wherein the substrate is a glass substrate with a poly-Si thin film formed on a surface thereof.

49. (Previously presented) A processed material formed by the method for forming a shallow junction according to claim 31.

50. (Previously presented) The method for forming a shallow junction according to claim 31, wherein the impurity includes boron.

51. (Previously presented) The method for forming a shallow junction according to claim 31, wherein the substrate includes a single crystalline silicon substrate.

52. (New) The method for forming a shallow junction according to claim 31, wherein an electric potential difference between the plasma and the semiconductor substrate surface is set to 20V or more, 200V or less.